CASIO®

Service Manual

(with price)

AP-10

INDEX

ELECTRONIC KEYBOARD

CONTENTS

SAFETY NOTICE

CAUTION!
Danger of explosion if battery is incorrectly replaced.
Replace only with the same of equivalent type recommended by the appliance manufacturer.Discard used batteries according to manufacturer's instructions.

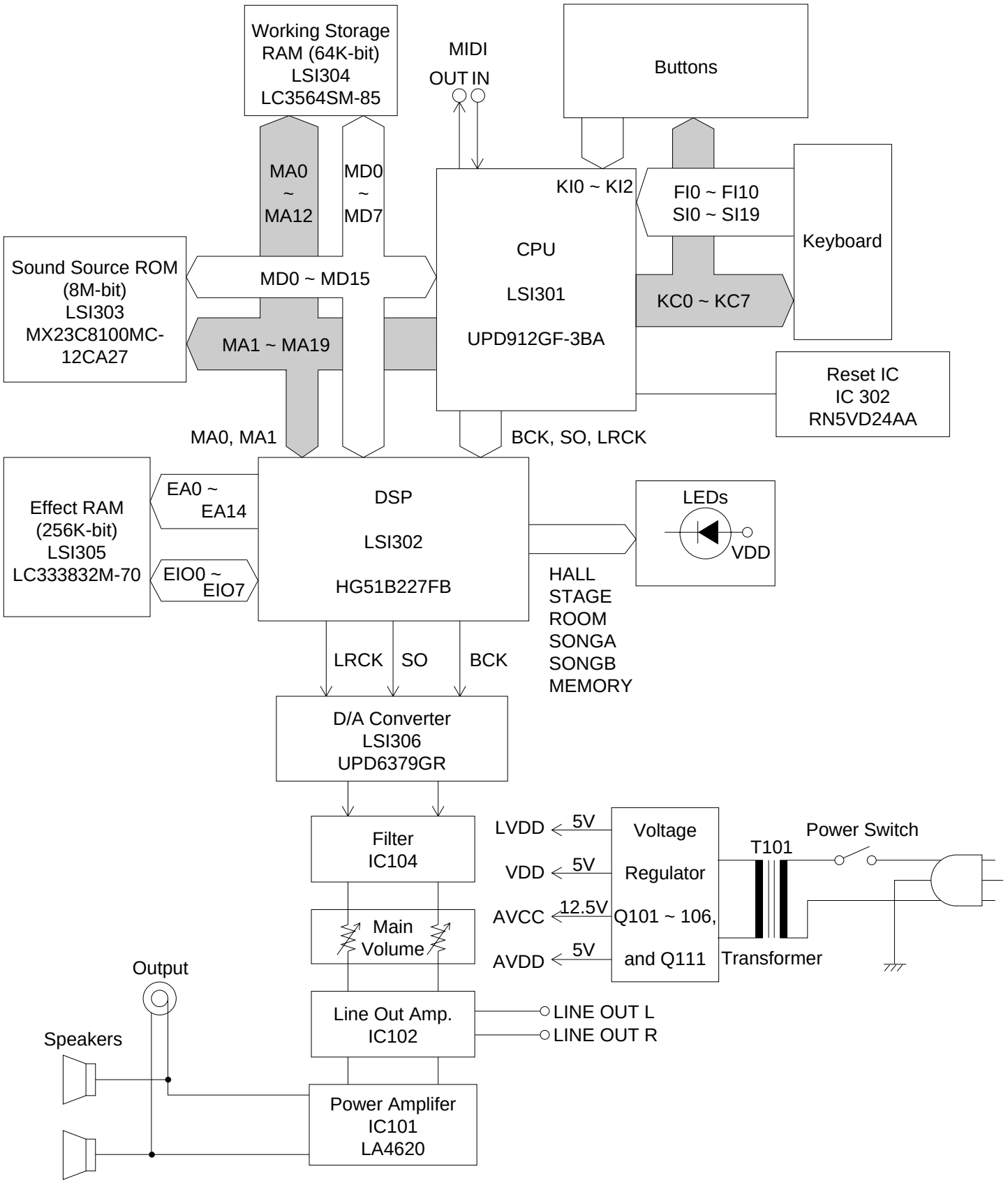
SPECIFICATIONS

GENERAL

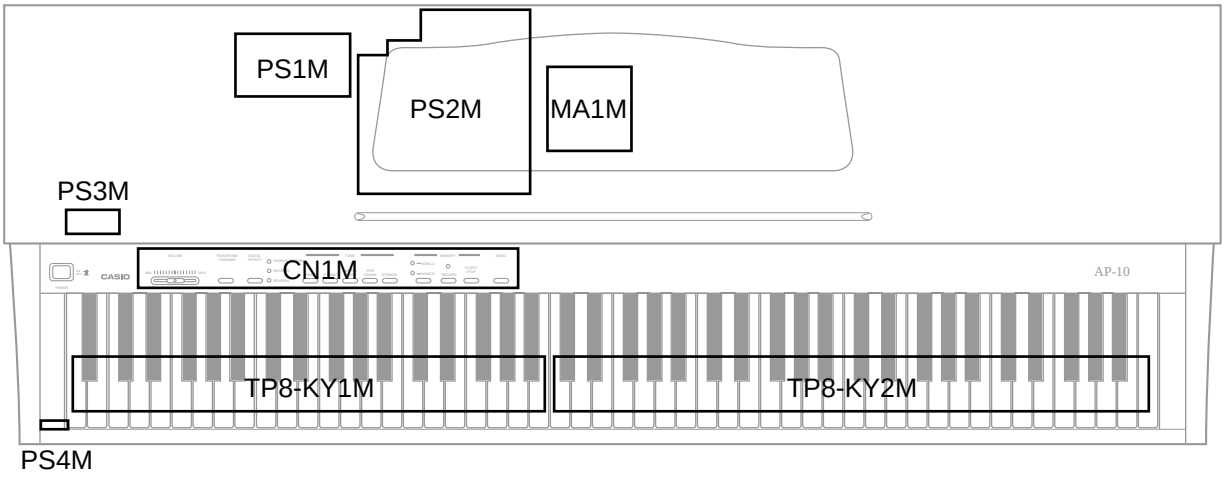
Number of keys:	88
Polyphonic:	24-note
Preset tones:	5, Piano-1, Piano-2, Electric Piano, Pipe Organ, Strings Layer: On/Off
Key transpose:	Range of ± 1 octave by a semitone increment
Effects:	Reverb-1/Reverb-2/Chorus reverb
Demo tunes:	5, 1. Grande valse brillante (F.F. Chopin) 2. One-Eighty (CASIO original) 3. Harmonious blacksmith (G.F. Handel) 4. Fugue in G minor (J.S. Bach) 5. Rainbow (CASIO original)
Memory:	Number of songs: 2 System: Real-time recording Memory capacity: Approx. 1200 notes total Memory backup battery: Built-in lithium battery Battery life: Approx. 5 years
Pedals:	Damper, Soft/Sostenuto
Tuning control:	440Hz ± 50 cents
Built-In Speakers:	14 cm dia. 10 W input rating: 2 pcs.
MIDI:	8-channel, multi-timbral reception
Terminals:	Line Out Jacks [Output impedance: 2 KΩ Output voltage: 1.5V (rms) MAX], Phone Jacks, MIDI Jacks (IN, OUT)
Power source:	120V AC (for U.S.A.) 120V/220V/230V/240V (for other countries)
Power consumption:	35 W (with 120V AC), 30 W (with 220V/230V/ 240V AC)
Dimensions (HWD):	Without stand: 165 × 1340 × 480 mm (6-1/2 × 52-13/16 × 18-15/16 inches) With stand: 805 × 1360 × 480 mm (31-11/16 × 53-9/16 × 18-15/16 inches)
Weight:	Without stand: 25.0 kg (55.1 lbs)/28.0 kg (61.7 lbs) With stand: 35.5 kg (78.3 lbs)/38.5 kg (84.9 lbs)

Note: There are two models of AP-10, one has a keyboard cover, the other has no keyboard cover.

BLOCK DIAGRAM



PCB LAYOUT

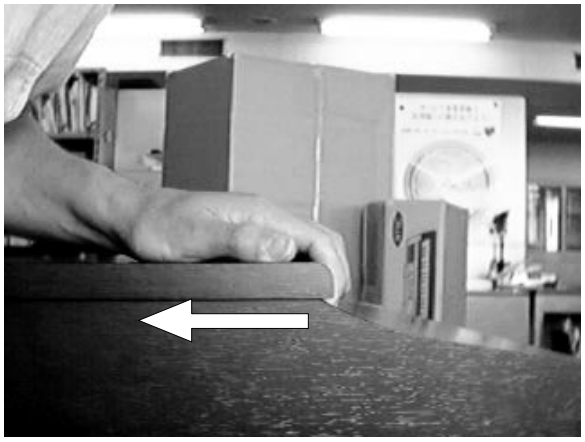


PCB	JCM358-	Components
Main PCB	MA1M	CPU, DSP, Sound Source ROM Working storage RAM, Effect RAM Reset IC, DAC
Sub PCB	PS2M	Filter, Lineout Amp., Power Amp. Power supply circuit. MIDI input/output.
Console PCB	CN1M	Main Volume, LEDs, Buttons
Other PCBs	PS1	Fuse, Noise filter
	PS3M	Head phone Jack
	PS4M	Power lamp

DISASSEMBLY INSTRUCTIONS

1. Disassembling top board

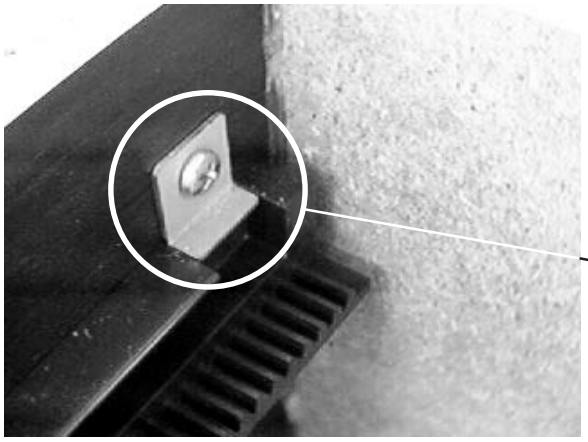
1-1. Remove 8 screws on the rear.
1-2. Slide the top board towards the rear. The top board will be free from catches on the case.
1-3. Lift the top board.



For keyboard-cover model

2. Disassembling the keyboard cover

2-1. Remove L-shape metal on inside of the side board.
2-2. Slide the keyboard cover to open fully.
2-3. Lift the keyboard cover.



For no-keyboard-cover model

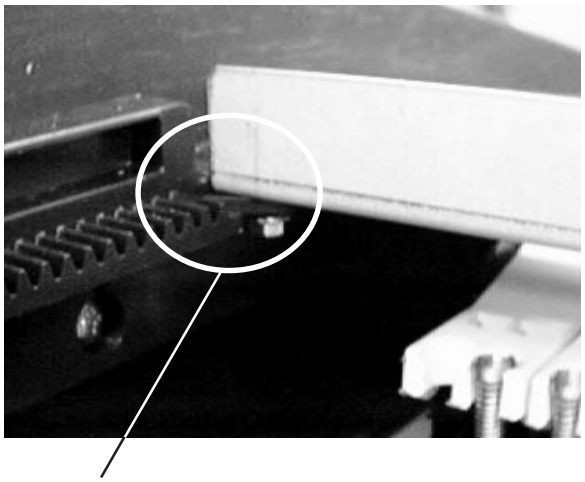
2. Disassembling the front cover

2-1. Remove 4 screws at both ends of the front cover.
2-2. Remove the front cover.

3. Disassembling the console panel

Note: To avoid scratch on the side board, put paper between the console panel and the side board at both ends.

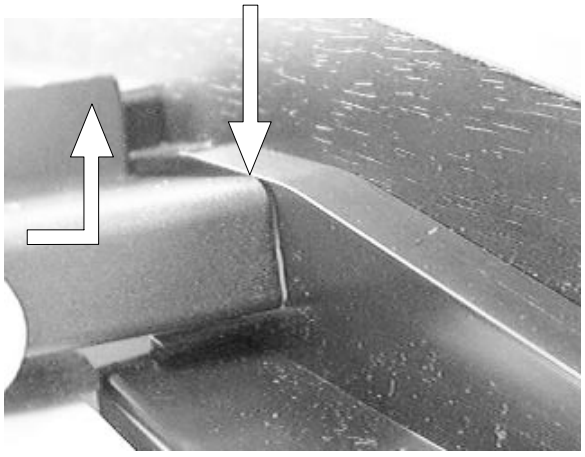
3-1. The console panel is fixed with screws and nuts.
Holding the nut, remove the screw.
3-2. Remove the screw fixing a grounding wire at the transformer.
3-3. Slide the console panel towards the front to free from catches.
3-4. Turn round the console panel.
3-5. Remove 2 screws fixing the power switch.



Hold this nut.

Insert paper here.

Insert paper here.

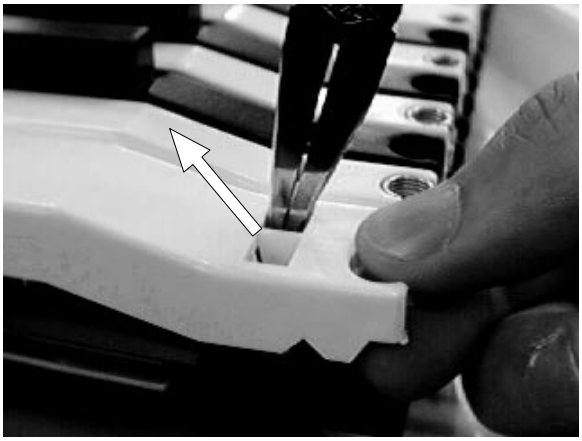


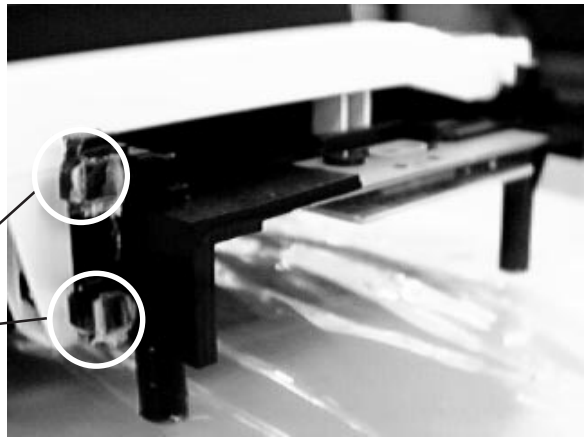
4. Disassembling keyboard unit

4-1. Remove 20 screws on the bottom.
4-2. Disconnect 2 connectors for the keyboard unit on the main PCB.
4-3. Remove the keyboard unit from the case.

5. Disassembling keys

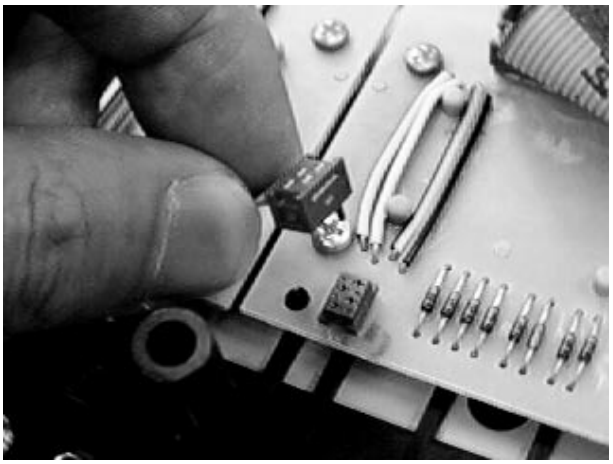
5-1. Remove a key spring.
5-2. Use a long-nose plier, pressing the hook, lift the key.





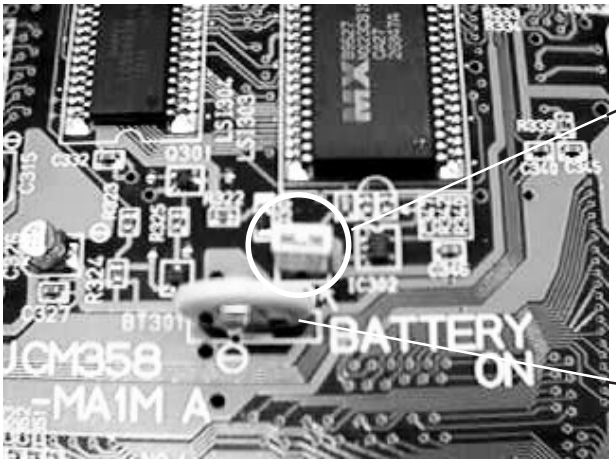
6. Disassembling keyboard PCBs

6-1. Turn around the keyboard unit to face the PCB up.
6-2. Disconnect the connector at middle of the keyboard.
6-3. Remove screws on keyboard PCBs



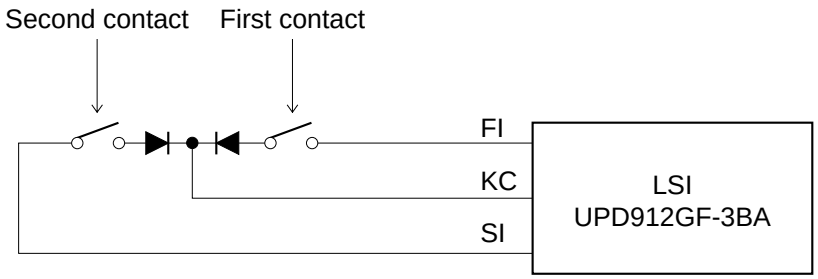
7. Replacing the main PCB

Note: The main PCB contains a lithium battery for memory back-up. Please remove the jumper before replacing the PCB.
And make sure that the jumper is reset on new main PCB after replacing the PCB. Because no jumper is set on a spare part of the main PCB.



CIRCUIT DESCRIPTION

KEYMATRIX



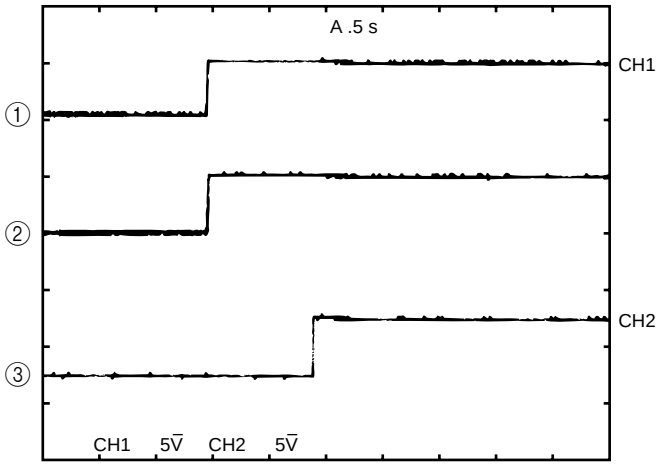
	KC0	KC1	KC2	KC3	KC4	KC5	KC6	KC7
FI0	A0 ①	A0 # ①	B0 ①	C1 ①	C1 # ①	D1 ①	D1 # ①	E1 ①
SI0	A0 ②	A0 # ②	B0 ②	C1 ②	C1 # ②	D1 ②	D1 # ②	E1 ②
EI1	F1 ①	F1 # ①	G1 ①	G1 # ①	A1 ①	A1 # ①	B1 ①	C2 ①
SI1	F1 ②	F1 # ②	G1 ②	G1 # ②	A1 ②	A1 # ②	B1 ②	C2 ②
FI2	C2 # ①	D2 ①	D2 # ①	E2 ①	F2 ①	F2 # ①	G2 ①	G2 # ①
SI2	C2 # ②	D2 ②	D2 # ②	E2 ②	F2 ②	F2 # ②	G2 ②	G2 # ②
FI3	A2 ①	A2 # ①	B2 ①	C3 ①	C3 # ①	D3 ①	D3 # ①	E3 ①
SI3	A2 ②	A2 # ②	B2 ②	C3 ②	C3 # ②	D3 ②	D3 # ②	E3 ②
FI4	F3 ①	F3 # ①	G3 ①	G3 # ①	A3 ①	A3 # ①	B3 ①	C4 ①
SI4	F3 ②	F3 # ②	G3 ②	G3 # ②	A3 ②	A3 # ②	B3 ②	C4 ②
FI5	C4 # ①	D4 ①	D4 # ①	E4 ①	F4 ①	F4 # ①	G4 ①	G4 # ①
SI5	C4 # ②	D4 ②	D4 # ②	E4 ②	F4 ②	F4 # ②	G4 ②	G4 # ②
FI6	A4 ①	A4 # ①	B4 ①	C5 ①	C5 # ①	D5 ①	D5 # ①	E5 ①
SI6	A4 ②	A4 # ②	B4 ②	C5 ②	C5 # ②	D5 ②	D5 # ②	E5 ②
FI7	F5 ①	F5 # ①	G5 ①	G5 # ①	A5 ①	A5 # ①	B5 ①	C6 ①
SI7	F5 ②	F5 # ②	G5 ②	G5 # ②	A5 ②	A5 # ②	B5 ②	C6 ②
FI8	C6 # ①	D6 ①	D6 # ①	E6 ①	F6 ①	F6 # ①	G6 ①	G6 # ①
SI8	C6 # ②	D6 ②	D6 # ②	E6 ②	F6 ②	F6 # ②	G6 ②	G6 # ②
FI9	A6 ①	A6 # ①	B6 ①	C7 ①	C7 # ①	D7 ①	D7 # ①	E7 ①
SI9	A6 ②	A6 # ②	B6 ②	C7 ②	C7 # ②	D7 ②	D7 # ②	E7 ②
FI10	F7 ①	F7 # ①	G7 ①	G7 # ①	A7 ①	A7 # ①	B7 ①	C8 ①
SI10	F7 ②	F7 # ②	G7 ②	G7 # ②	A7 ②	A7 # ②	B7 ②	C8 ②

POWER SUPPLY CIRCUIT

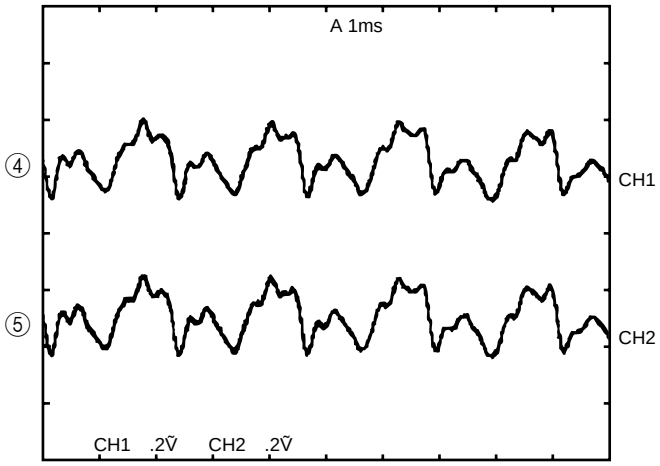
The power supply circuit generates five voltages as shown in the following table.

Name	Voltage	For operation of
VDD	+5 V	CPU, Reset IC, DSP, Sound source ROM, Working storage RAM, Effect RAM, LEDs
AVDD	+5 V	DAC
LVDD	+5 V	Power lamp
AVCC	+12.5 V	Filter
VC	V	Power amplifier

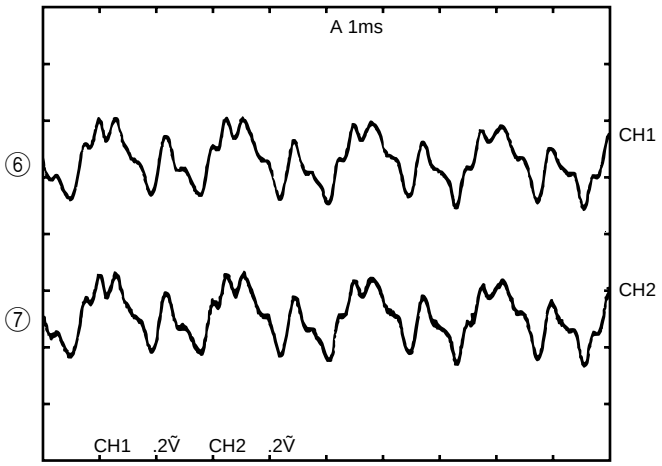
MAJOR WAVEFORMS



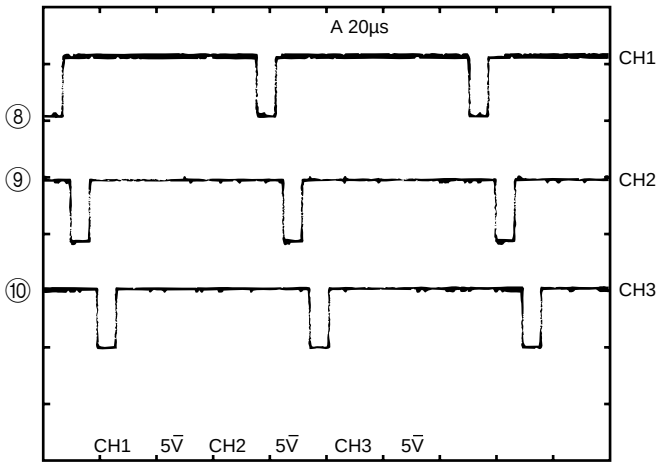
① VDD CA connector pin 6
② NMI CA connector pin 8
③ POWER CA connector pin 9



④ DAC output CA connector pin 1
⑤ DAC output CA connector pin 2



⑥ Filter output CF connector pin 5
⑦ Filter output CF connector pin 4



⑧ Key scan signal KC0 CC connector pin 2
⑨ Key scan signal KC1 CC connector pin 4
⑩ Key scan signal KC2 CC connector pin 6

Tone : Pipe Organ
Key : A4

TROUBLESHOOTING

1. No power

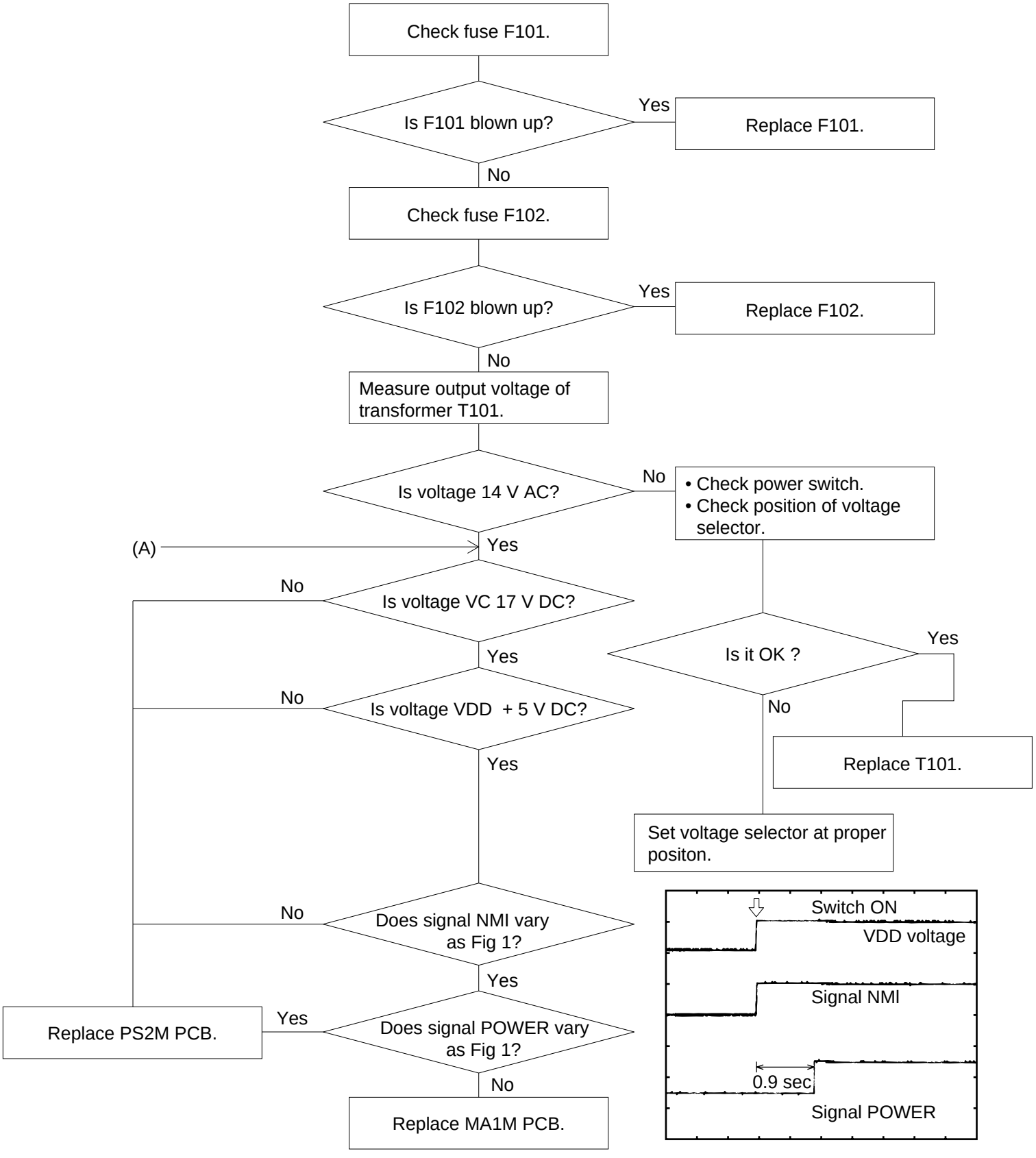
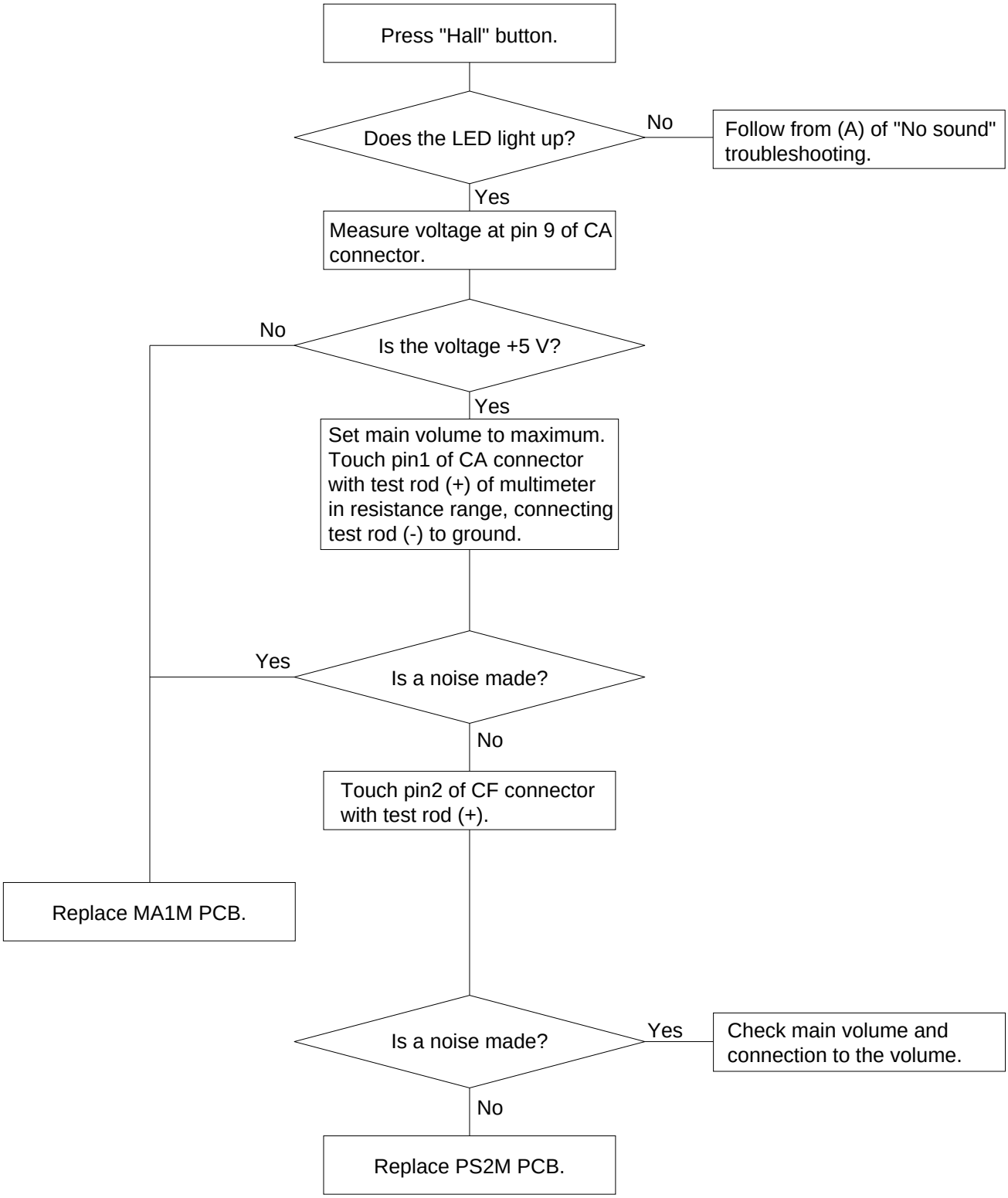
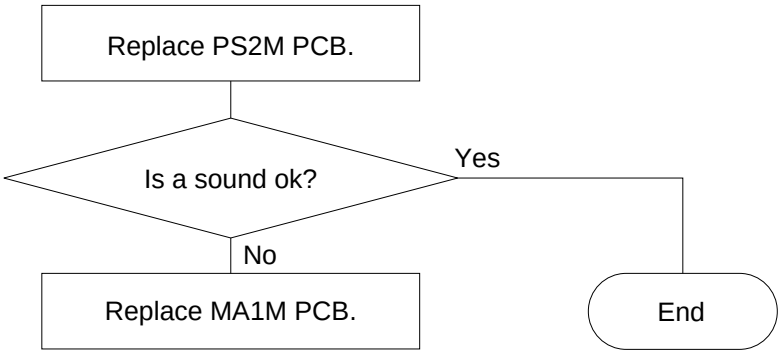


Fig 1

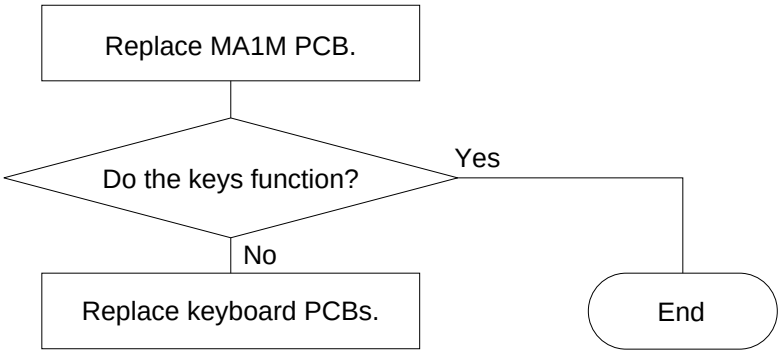
2. No sound


Press "Hall" button.
Does the LED light up?
No
Follow from (A) of "No sound" troubleshooting.
Yes
Measure voltage at pin 9 of CA connector.
Is the voltage +5 V?
No
Yes
Set main volume to maximum. Touch pin1 of CA connector with test rod (+) of multimeter in resistance range, connecting test rod (-) to ground.
Is a noise made?
Yes
No
Touch pin2 of CF connector with test rod (+).
Replace MA1M PCB.
Is a noise made?
Yes
Check main volume and connection to the volume.
No
Replace PS2M PCB.

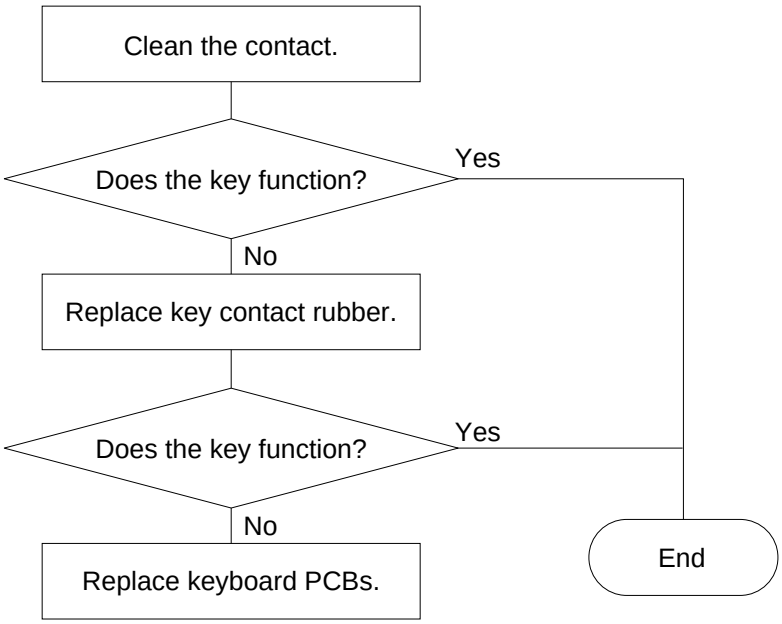
3. Distorted sound



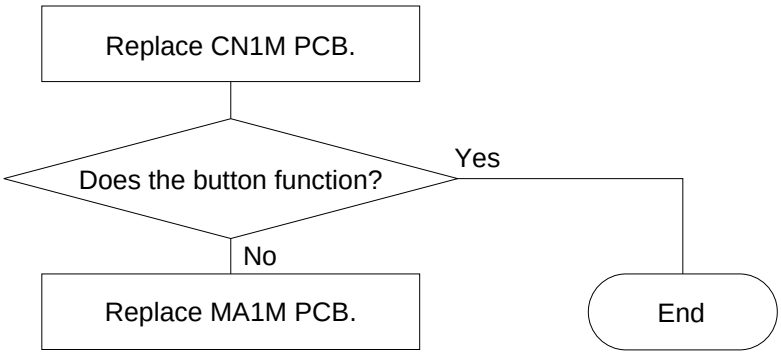
4. Certain keys do not function



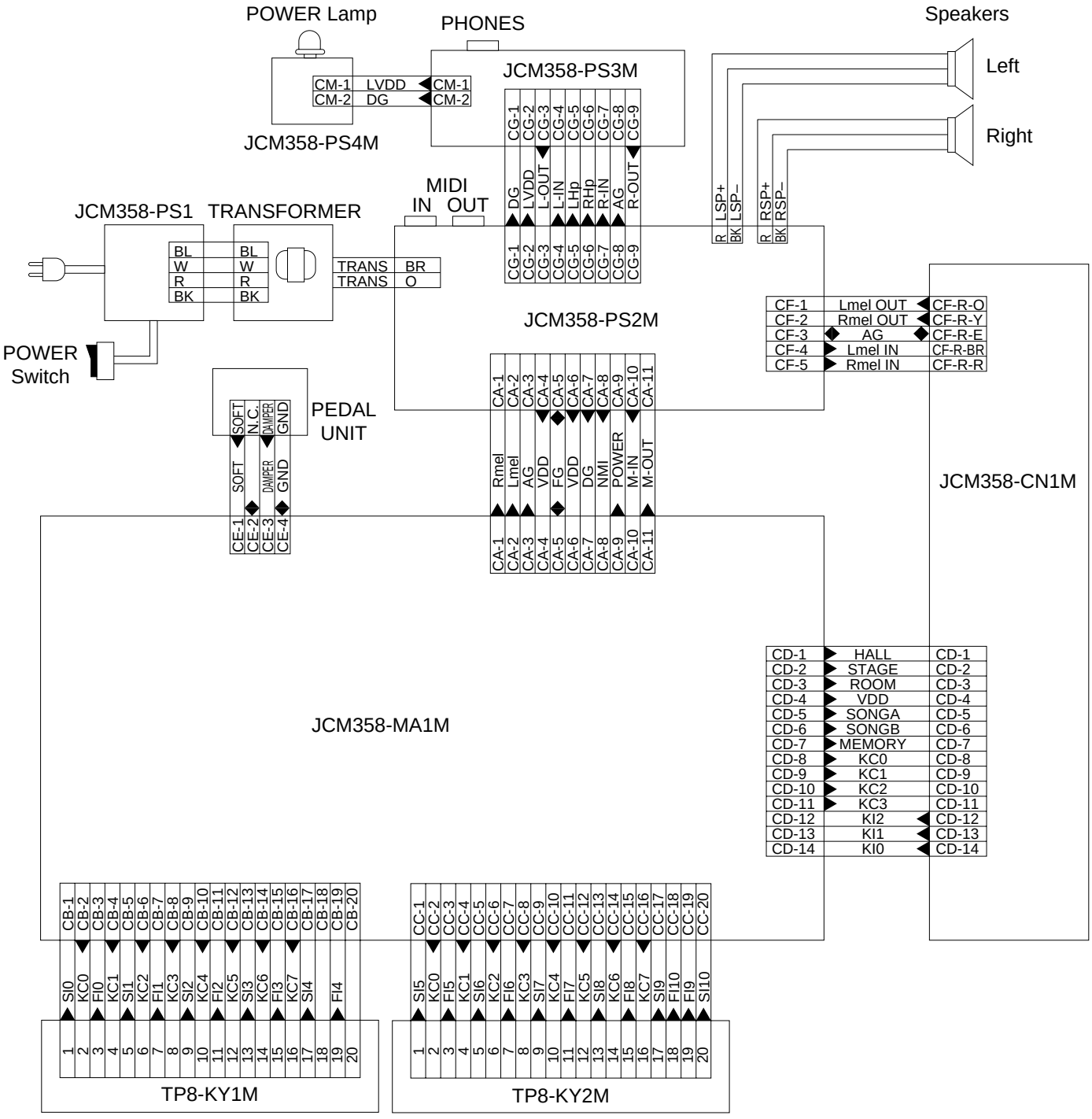
5. A certain key does not function



6. A certain button does not function

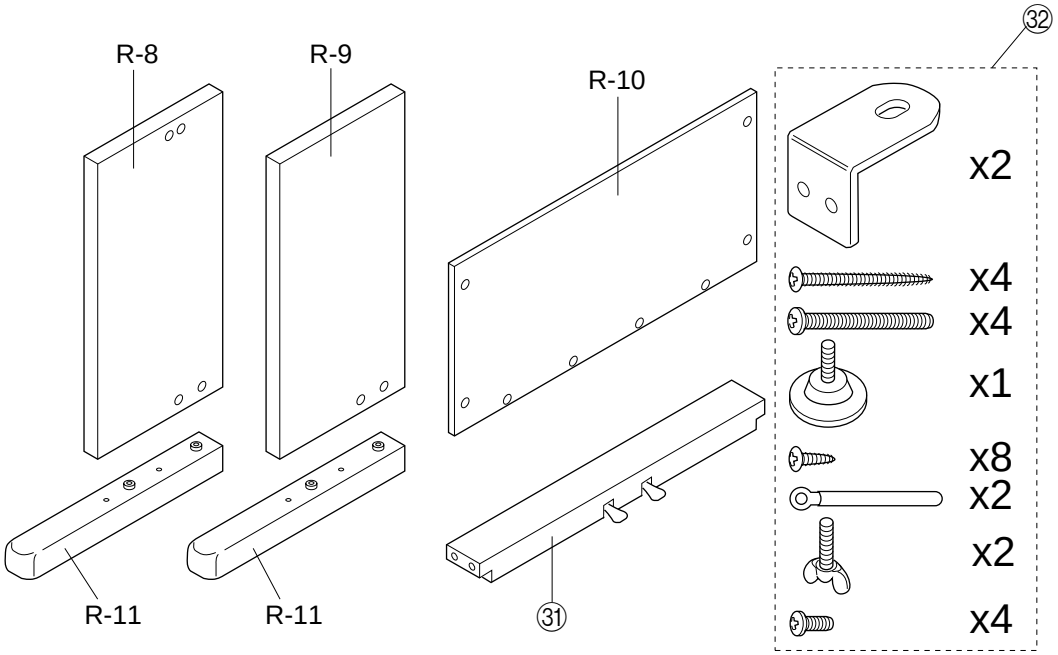


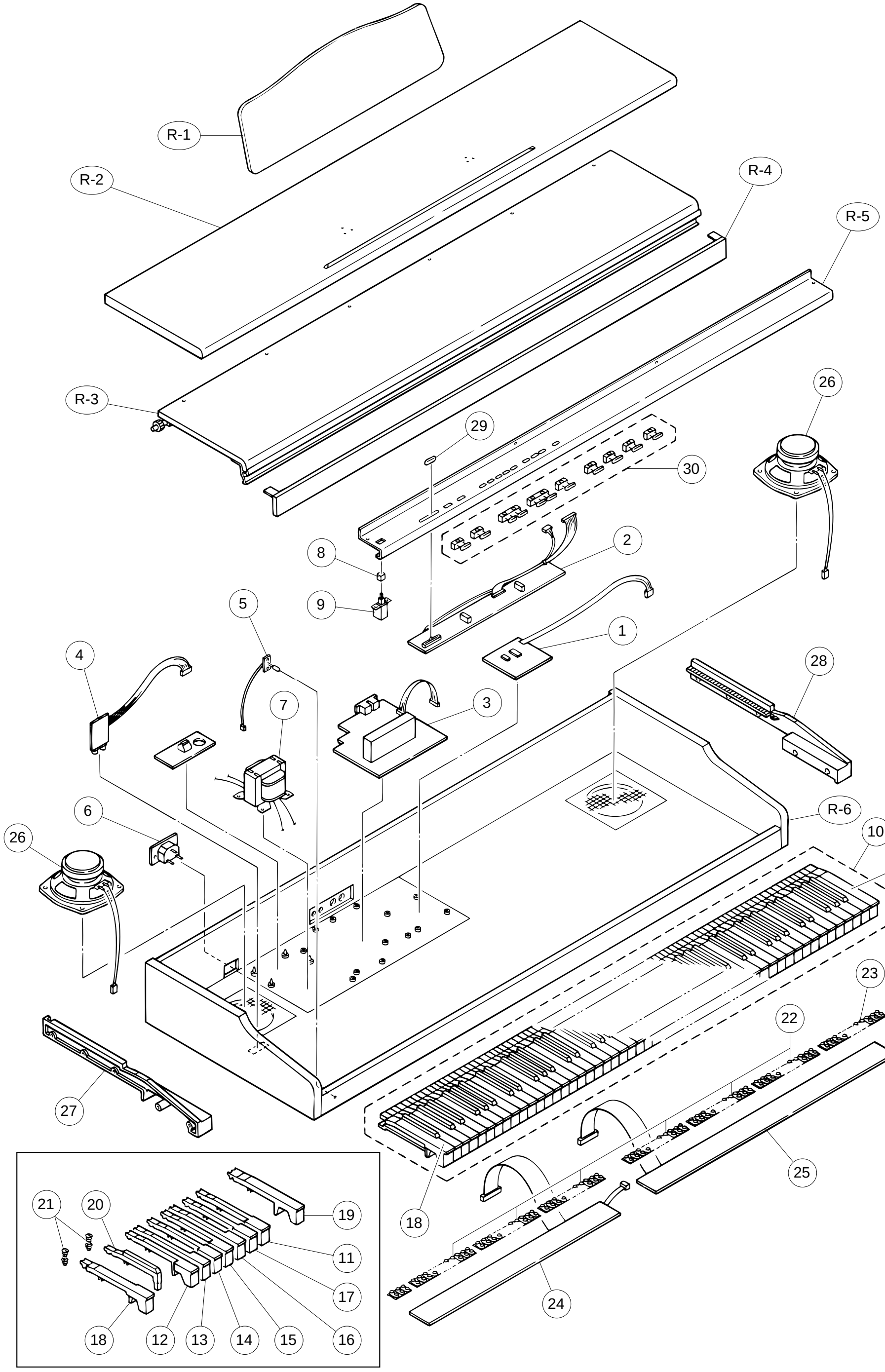
WIRING DIAGRAM



EXPLODED VIEW

STAND




R-1
R-2
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R-4
R-5
R-6
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PARTS LIST

AP-10

Notes: This parts list does not include the cosmetic parts, which parts are marked with item No. "R-X" in the exploded view.
Contact our spare parts department if you need these parts for refurbish.

1. Prices and specifications are subject to change without prior notice.

2. As for spare parts order and supply, refer to the "GUIDEBOOK for Spare parts Supply", published seperately.

3. The numbers in item column correspond to the same numbers in drawing.

N	Item	Code No.	Parts Name	Specification	Q	M	FOB Japan N.R.Yen Unit Price	R
		Main PCB						
	BT301	3815 0714	Lithium battery	CR1220/1VC	1		130	B
N	D301	2390 2555	Chip schottky diode	RB500V-40TE-17	1		24	B
	IC302	2105 5173	MOS IC	RN5VD42AA-TR	1		75	B
	LSI301	2012 2072	LSI	UPD912GF-3BA(T)	1		750	A
	LSI302	2012 2079	LSI	HG51B227FB-1	1		500	A
	LSI303	2012 1890	LSI	MX23C8100MC-12CA27	1		600	A
N	LSI304	2012 1764	LSI	LC3564SM-85-TRM	1		320	A
	LSI305	2012 0777	LSI	LC33832M-70-TLM	1		410	A
	LSI306	2105 4746	LSI	UPD6379GR-E1	1		150	A
	Q301	2250 1162	Chip transistor	2SA1576A-T106R	1		8	B
	Q302	2252 0637	Chip transistor	2SC4081-T106R	1		6	B
N	X301	2590 2387	Crystal oscillator	HC-49/US24B	1		110	B
N	X302	2590 2079	Ceramic oscillator	CSACS16.00MX040-TC	1		68	B
N	1	6924 4790	Main PCB ass'y M358-MA1M	M240318*1	1		5,590	A
		Console PCB						
	LED401 - 406	2370 0630	LED	LN282RPX-(TX3)	6		21	B
	SW401 - 411	3412 0903	Tact switch	EVQ-21405R	11		14	A
	VR401	2765 0280	Slide volume	EWA-NAXCH1B14	1		100	A
N	2	6924 4860	Console PCB ass'y M358-CN1M	M240321*1	1		1,220	A
		Amp. PCB						
	D101	2390 2366	Diode stack	S4VB20-4033(L10)	1		190	B
N	F102	3632 0427	Fuse, time-lag	(S)T-6.3A	1		62	A
	F102	3632 0420	Fuse, time-lag	UL-TSC-6.3A-N1	1		62	A
	IC101	2114 1883	IC, Amp.	LA4620	1		270	A
	IC102, IC104	2114 1799	IC, OP-amp.	M5218APR	2		35	B
	IC103	2114 1421	IC, photocoupler	PC900V	1		100	B
	J101/102	3612 0789	Jack	YKB21-5010	2		35	A
	J103	3501 4816	DIN jack	YKF51-5051	1		100	B
	Q101	2253 0455	Transistor	2SD1762E,F	1		47	A
	Q102 - 106, Q109 - 111	2220 1387	Transistor	2SC1740SQ-TP-T	8		8	A
	Q107/108	2253 0420	Transistor	2SD1468SR,S-TP-T	2		16	A
	ZD101	2360 2044	Zener diode	MTZJ6.2AT-77-T	1		8	A
N	ZD102	2360 2737	Zener diode	MTZJ10CT-77-T	1		8	A
N	ZD103	2360 2772	Zener diode	MTZJ13CT-77-T	1		8	A
	ZD104 - 106	2360 1946	Zener diode	MTZJ5.6CT-77-T	3		8	A
N	3	6924 8210	Amp. PCB ass'y M358-PS2M	M140332*2	1		3,180	A
		PS1 & PS3M PCBs						
	F101	3632 0287	Fuse, time-lag	(S)T-0.63A	1		49	A
	F101	3632 0294	Fuse, time-lag	MT4-2A-N1	1		64	A
N	4	6924 4840	PCB ass'y M358-PS3M	M340345*1	1		880	B
N	5	6924 4920	PCB ass'y M358-PS4M	M340346*1	1		470	B
	J104	3613 1533	Jack, phone	HLJ4336-01-3040	1		170	A
		Other electrical parts						
	LED101	2320 9748	LED	LN28RPH	1		20	B
	6	3613 0217	Receptacle	NC-174-10-C	1		110	C
N	7	3012 1449	Transformer	TE-358-1M1	1		1,290	B
	8	6924 5260	Power button	M340318-1	1		13	B
	9	3412 1827	Power switch	SDDLD1-A2-D	1		130	A
		Keyboard unit						
N	10	6924 1810	Keyboard unit	88TP/8CASIO	1		7,180	B
N	11 ~ 17	6924 9040	White key, 1-octave	88TP8(42123530)	7		450	A
N	20	6924 9030	Black key, 1-octave	88TP8(42123460)	7		360	A

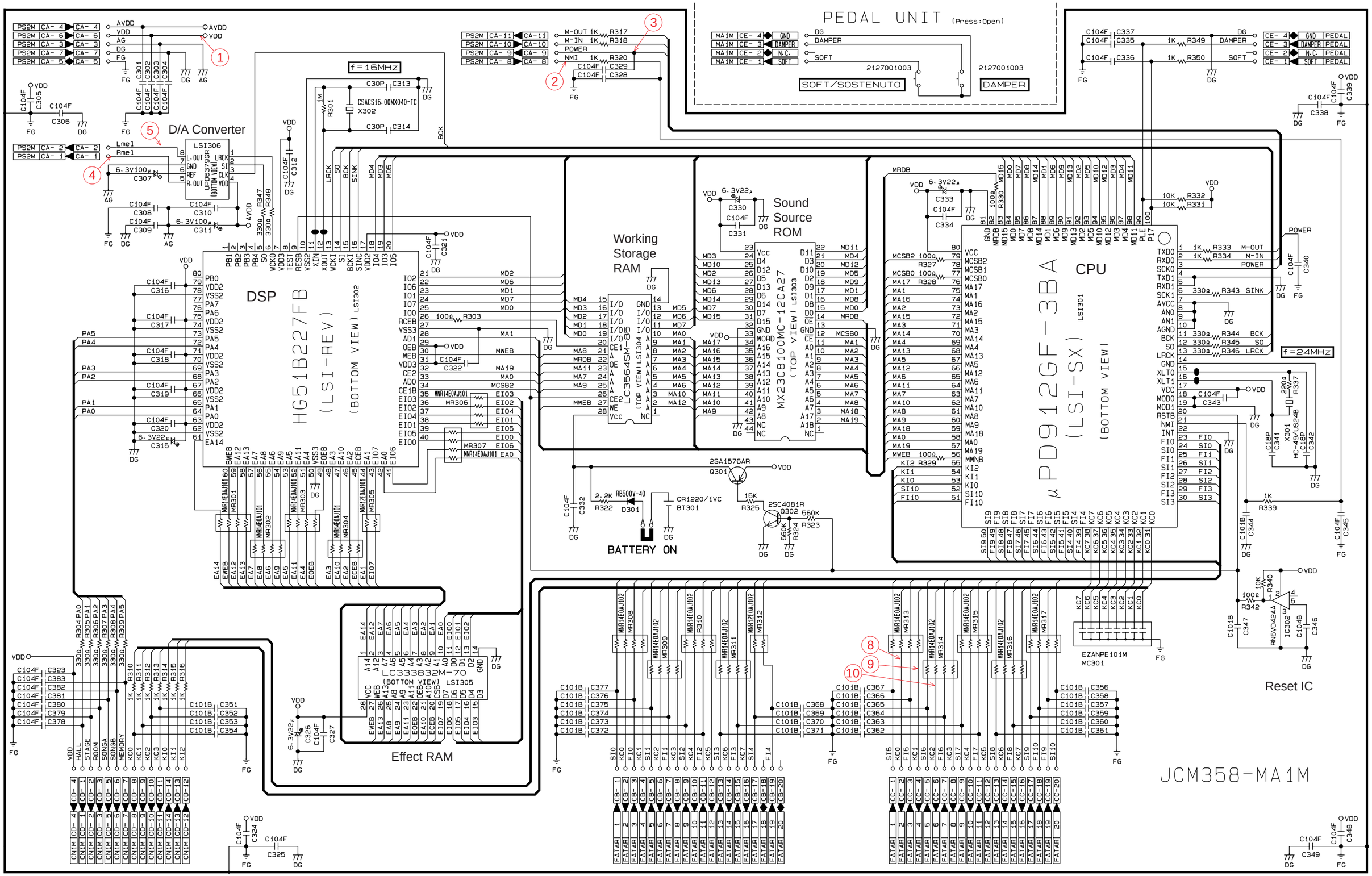
Notes: N – New parts
M – Minimum order/supply quantity
R – Rank

N	Item	Code No.	Parts Name	Specification	Q	M	FOB Japan N.R.Yen Unit Price	R
N	21	6924 9050	Spring, for key	88TP8(23105360)	88		21	B
N	22	6924 9190	Contact, rubber, for key, 12	88TP10/8(2564230)	6		150	A
N	23	6924 9200	Contact, rubber, for key, 13	88TP10/8(2564240)	1		160	A
N	24	6924 9060	Keyboard PCB (DX)	88TP10/8(42912070)	1		2,800	C
N	25	6924 9070	Keyboard PCB (SX)	88TP10/8(42912080)	1		3,500	C
		Mechnical parts						
	26	3831 0966	Speaker	SG13G01BFA	2		510	B
	27	6924 5390	Rack L	1037153000	1		170	B
	28	6924 5410	Rack R	1037154009	1		170	B
	29	6919 3241	Slide knob	M311405A-1	1		17	B
N	30	6924 5240	Button set 358	M240303*1	1		110	B
		Stand						
	31	6924 6670	Pedal box ass'y	A190007200	1		3,920	B
N	32	6924 7100	Screw set for AP-10's stand	A190007300	1		410	B
		AC cord						
		3701 0196	AC cord (120V, USA)	UC-964-J01	1		650	C
		3701 0595	AC cord (230V, Europe)	EC-654-E06	1		720	C
		3701 0588	AC cord (230V, UK)	BC-323-J01	1		860	C
		3701 0553	AC cord (240V, Australia)	SC-101-J02	1		660	C

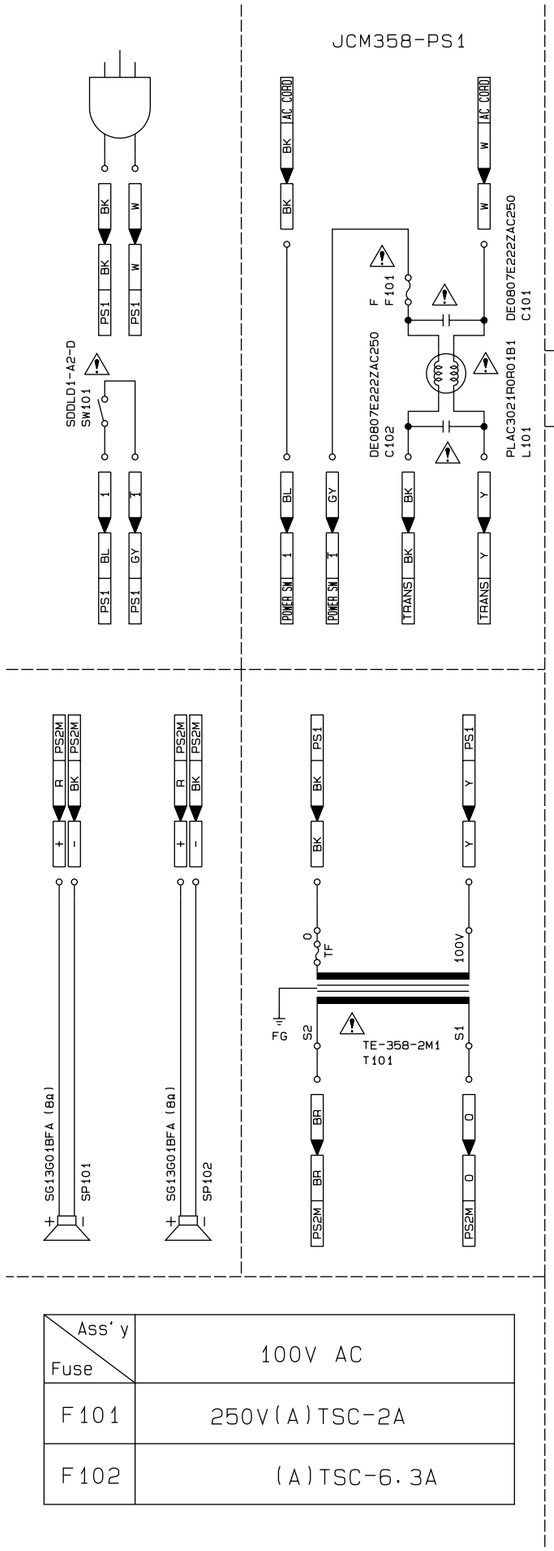
Notes: N – New parts
M – Minimum order/supply quantity
R – Rank

SCHEMATIC DIAGRAMS

MAIN PCB (A) JCM358-MA1M

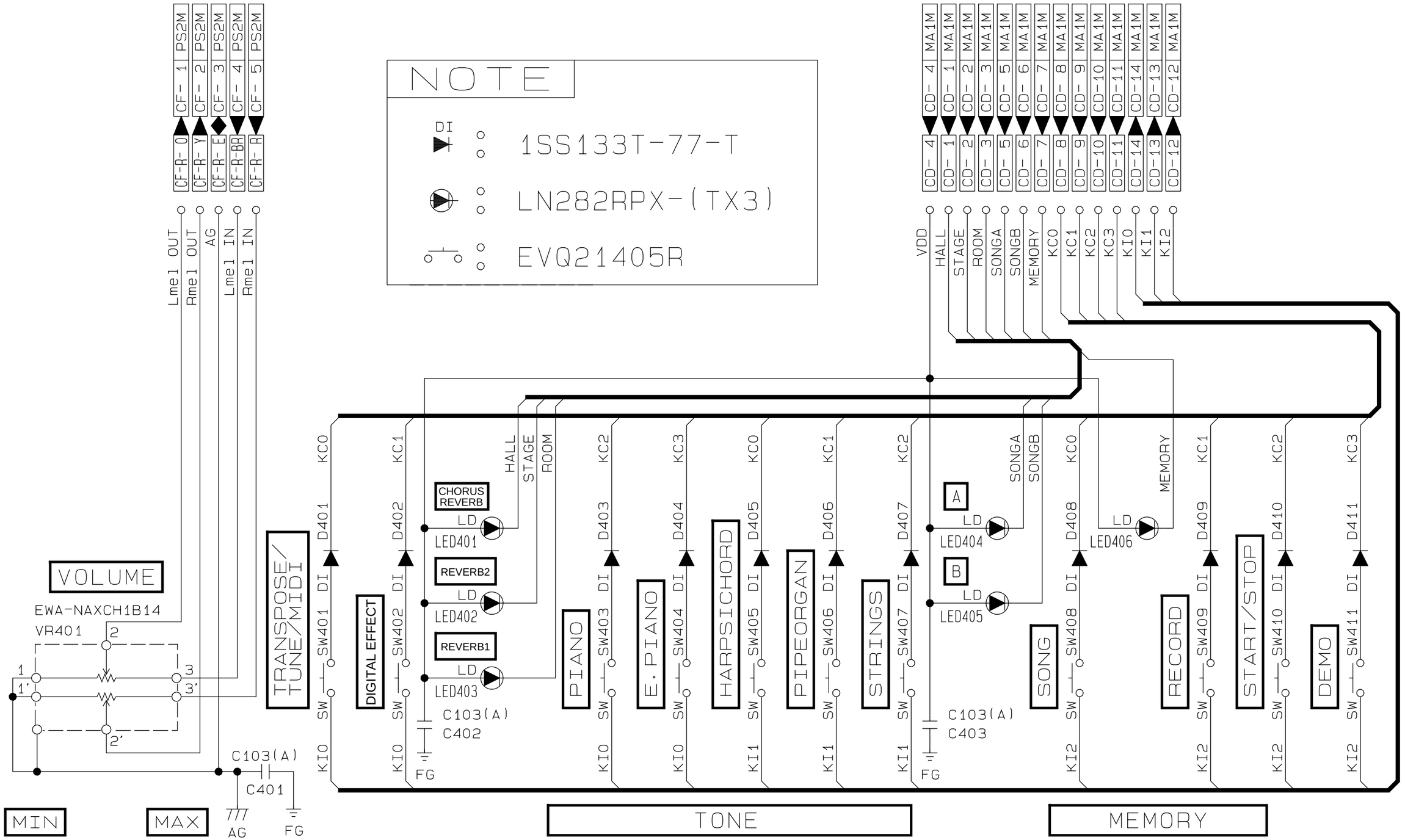


MAIN (B) & POWER SUPPLY PCBs JCM358-PS1/PS2M/PS3M/PS4M



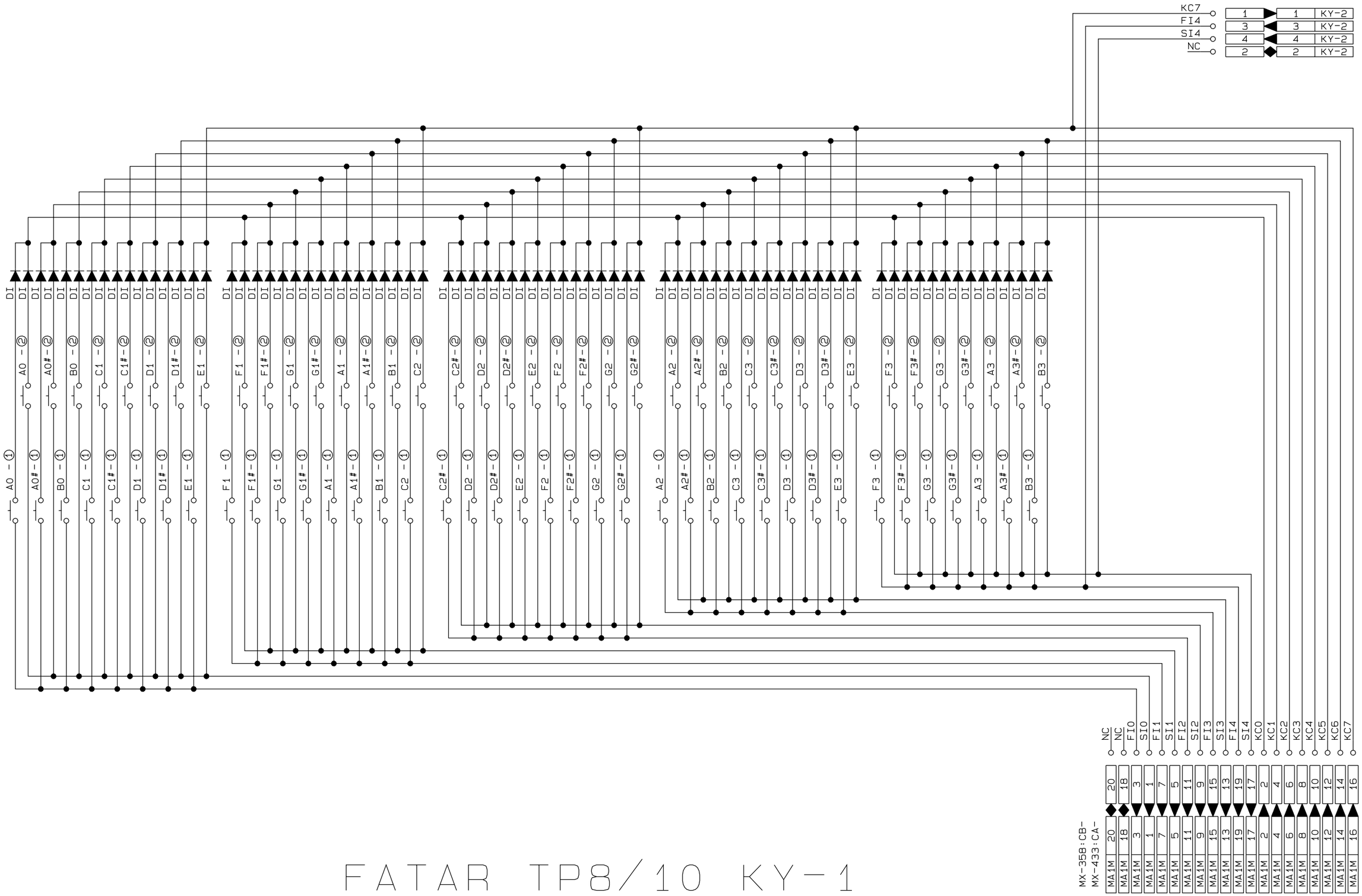
Ass'y / Fuse	100V AC
F101	250V(A)TSC-2A
F102	(A)TSC-6.3A

CONSOLE PCB JCM358-CN1M



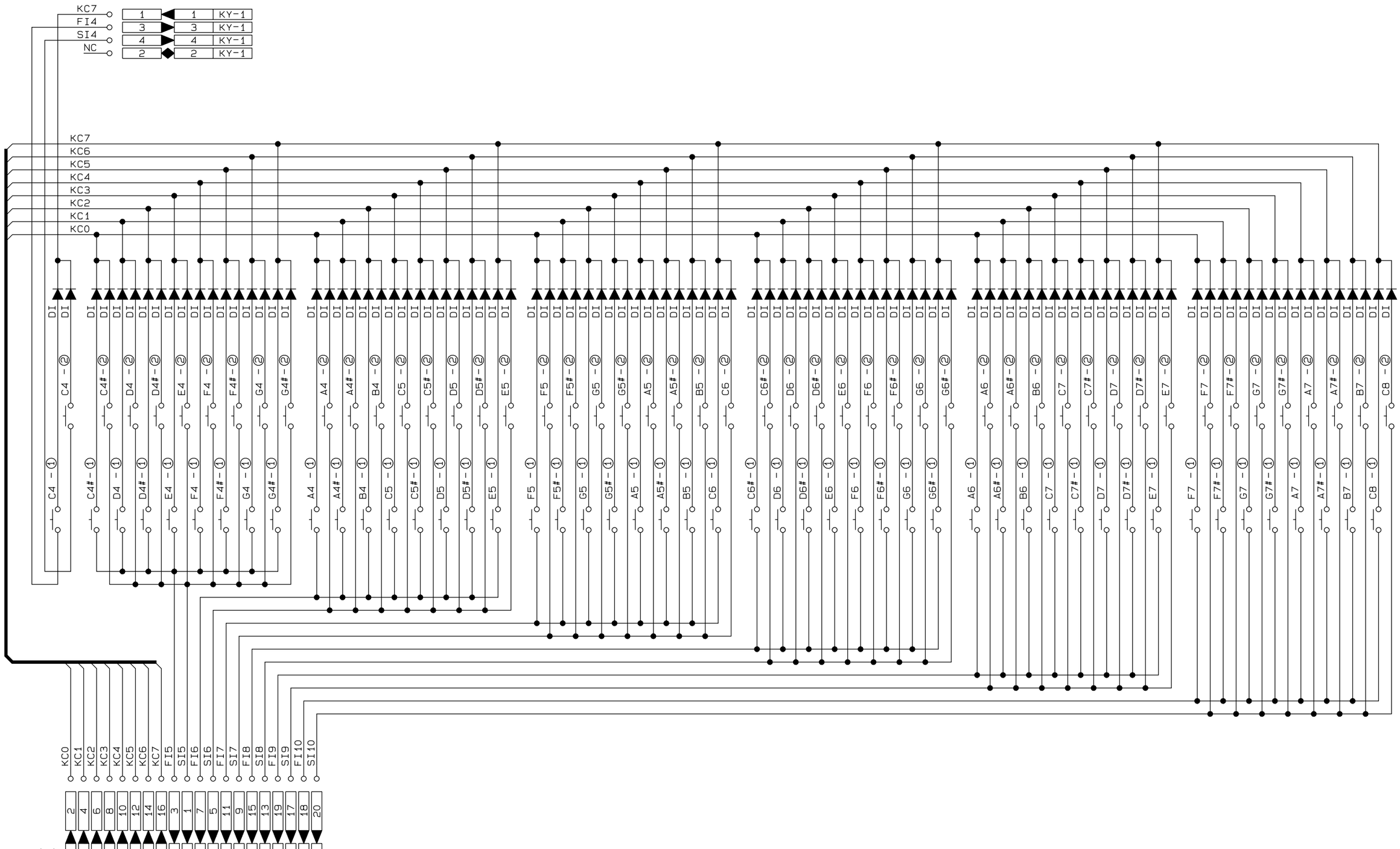
JCM358-CN1M

KEYBOARD PCB TP8-KY1



FATAR TP8/10 KY-1

KEYBOARD PCB TP-KY2



FATAR TP8/10 KY-2

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